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REMARKS

The above amendment and below remarks are responsive to the Office Communication dated September 7, 2005.

The pending Claims are 1, 3, 4, 12-15 and 23.

The specification has been amended to correct obvious typographical errors. A new drawing sheet 18/25 is submitted herewith to correct an obvious typographical error. No new matter is introduced.

Claim 1 has been amended to incorporate the subject matter of Claim 2, and Claim 2 is canceled. No new matter is introduced.

Each of the Examiner's rejections are discussed separately below.

Rejections under 35 U.S.C. § 112, Second Paragraph

Claims 13-15 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

The Examiner has stated that the terms "alkylenearyl" and "alkyleneheteroaryl" are unclear. Applicants submit that these terms are the same as "arylalkylene" and "heteroarylalkylene", respectively. The alkylene is a group derived from an aliphatic hydrocarbon and having two points of attachment: one is to the aryl or heteroaryl group (each of which has only one point of attachment) and the other is to the quinoxaline ring at position R⁴ or R⁵. The groups can be substituted or unsubstituted, as indicated at page 4, line 12.

The Examiner has further requested clarification of the term "n" in Claim 13. Applicants have explicitly listed "0" when applicable. The term "n" cannot be 0.

Applicants request that the 35 U.S.C. § 112 rejection be withdrawn.

Rejections under 35 U.S.C. § 102 (b): Claims 1, 3, 4 and 23

Claims 1, 3, and 23 were rejected under 35 U.S.C. § 102 (b) as being anticipated by Adachi et al., *J. of Applied Physics* 90 (10), pp 5048-5051 (Nov. 15, 2001) ("*Adachi*"). Claim 4 was also rejected as being anticipated by Adachi and the Examiner further relied on Naka et al in *Appl. Phys. Lett.* 76 (2), pp.197-199 (Jan. 10, 2000) ("*Naka*") and Redecker et al in *Appl. Phys. Lett.* 75(1), pp. 109-111 (July 5, 1999) ("*Redecker*").

Claim 1 has been amended to include the subject matter of Claim 2. Applicants respectfully submit that this amendment to Claim 1 addresses and overcomes the rejection.

Applicants request that the 35 U.S.C. § 102 be withdrawn.

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Rejection under 35 U.S.C. § 103 (a): Claim 2

Claim 2 was rejected under 35 U.S.C. § 103(a) as having been unpatentable over *Adachi* in view of *Egusa et al.*, U.S. Patent 5,294,810 ("*Egusa*"). Applicants respectfully traverse this rejection.

Egusa relates to an organic electroluminescent device in which electrons and holes are injected and accumulated in a multi-layered structure of organic films. The Examiner has pointed to the figures of *Egusa* to teach the relative energy levels of the LUMO of the electron transport/anti-quenching layer and the cathode work function, as recited in Applicants' Claim 2, now incorporated into newly amended Claim 1. The Examiner stated that layers O3 and O2 of *Egusa* Figure 18 were representative of the device of *Adachi*, and layers O2 and O3 of *Egusa* Figure 2 were representative of the device of Applicants' Claim 2. Applicants respectfully submit that O3 in *Egusa* Figure 18 and O2 in *Egusa* Figure 2 are both hole transport layers (see, e.g., column 7, lines 4-7 of *Egusa*). Furthermore, the devices in Figures 2 and 18 are both examples of embodiments of the invention of *Egusa*. One is not favored over the other. Nothing in *Egusa* teaches or suggests a device having the three energy level relationships as recited in currently amended Claim 1.

Applicants submit that one of ordinary skill in the art would not know which energy relationship to choose from among the many figures of *Egusa* to substitute for one of the energy relationships in *Adachi*. There is no teaching or suggestion in *Adachi* and *Egusa*, individually or collectively, that in a photoactive device, all three recited provisos of pending Claim 1 should be met:

- (1) [LUMO of electron transport/anti-quenching layer] - [work function of cathode] < 1eV
- (2) [LUMO of electron transport/anti-quenching layer] - [LUMO of cyclometalated complex] > 0
- (3) [HOMO of cyclometalated complex] - [HOMO of electron transport/anti-quenching layer] > -1eV

Absent the teachings of the inventors in the above referenced application, the Examiner would not know which energy relationships to choose for a device.

Applicants respectfully request that this rejection be withdrawn.

Rejection under 35 U.S.C. § 103 (a): Claims 1-4, 12 and 23

Claims 1-4, 12, and 23 were rejected as being obvious in view of U.S. Patent No. 6,723,445 ("*Li*") and further in view of U.S. Patent No. 5,294,810 ("*Egusa*"). Applicants respectfully traverse this rejection.

Li teaches the use of dibenzoquinoxalines as electron transport materials in organic light-emitting devices. *Li* does not teach the energy relationships among the layers. As discussed above, *Egusa* does not teach the energy relationships of Applicants' Claim 1, and

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the claims dependent thereon. None of the figures in *Egusa* shows a device meeting the three provisos of Applicants' Claim 1. Substituting the quinoxaline of *Li* into any of the devices of *Egusa* does not result in any of Applicants' claimed devices as recited in Claims 1, 3, 4, 12, and 23.

Applicants respectfully request that this rejection be withdrawn.

Rejection under 35 U.S.C. § 103 (a): Claims 1-4, 12-14, and 23

Claims 1-4, 12-14 and 23 were rejected as being obvious in view of U.S. Patent Publication US 2002/ 0135292 A1 ("*Kamatana*"), in view of U.S. Patent No. 6,723,445 ("*Li*") and U.S. Patent No. 5,294,810 ("*Egusa*"). Applicants respectfully traverse this rejection.

Kamatana discloses electroluminescence devices having a charge transport layer formed using a mixture of a plurality of organic compounds which are mutually structural isomers. The structural isomers can be represented by formula (1), $(R-X)_n-Ar-(X'-R')_m$, where "Ar" is a connected ring structure of two single rings or two sets of fused rings connected with a single bond. Ar can be represented by formula (2), A-B. It is true that A and/or B can be a quinoxaline moiety, however that results in bis-quinoxaline compound, a compound having two quinoxalines joined together by a single bond. That is not the same as any of Applicants' quinoxaline derivatives recited in Applicants' Claim 15.

Furthermore, *Kamatana* does not teach the energy relationships among the layers. As discussed above, none of *Egusa*, *Li*, or the combination thereof teaches the energy relationships of Applicants' Claim 1, and the claims dependent thereon. None of the figures in *Egusa* shows a device meeting the three provisos of Applicants' Claim 1. Substituting the bis-quinoxaline of *Kamatana* and the iridium emitter of *Li* into any of the devices of *Egusa* does not result in any of Applicants' claimed devices as recited in Claims 1, 3, 4, 12-14, and 23.

Applicants respectfully request that this rejection be withdrawn.

Provisional Double Patenting Rejection

Claims 1-4, 12-15 and 23 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 42-62 of copending Application No. 10/612,704 ("*'704*"). Applicants respectfully traverse this rejection.

The present application and '*704* both claim priority from the same provisional applications and have the same filing date. Applicants submit that '*704* is not available as reference against the present application. Furthermore, Applicants submit that the claims in

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the present application are patentably distinct over the '704 claims. The '704 claims recite a device having at least one layer comprising a quinoxaline. In the present application, the claims are directed to a device having a quinoxaline in the electron transport/anti-quenching layer, where the photoactive layer comprises a cyclometalated complex of a transition metal, and where the three provisos with respect to energy relationships are satisfied. Applicants can find no evidence in the prior art, including the art discussed above, that one of ordinary skill would have known to select the three provisos of Applicants' claims.

Applicants respectfully request that this rejection be withdrawn.

Miscellaneous

Applicants have corrected the obvious typographical error and changed "V" to "eV" for the unit of energy and work function. Applicants thank the Examiner for pointing this out.

With respect to the energy levels of the photoactive layer and the photoactive material, Applicants submit that it is the energy levels of the photoactive material in the photoactive layer that is governing, as discussed in the paragraph bridging pages 8 and 9. Thus the claims recite the HOMO and LUMO levels of the cyclometalated complex of a transition metal complex, which is the photoactive material.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that the above referenced pending application is in condition for allowance and an Notice of Allowance for the pending claims is earnestly requested.

Respectfully submitted,



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